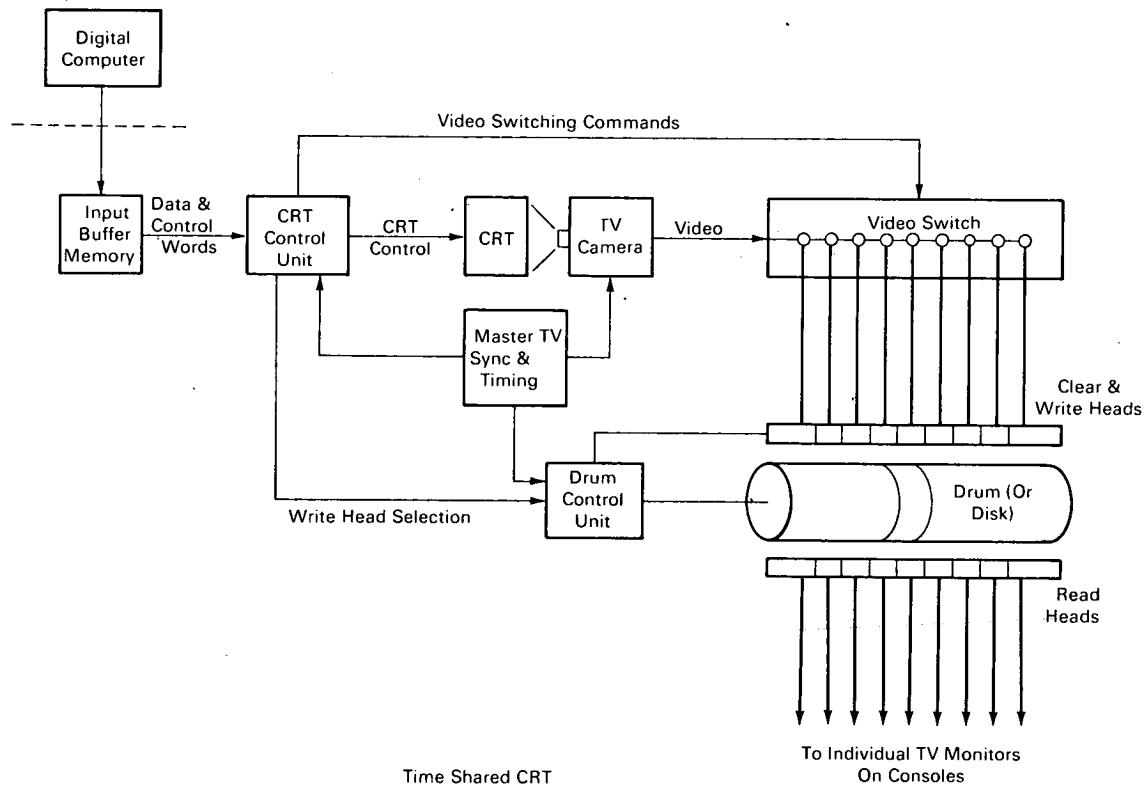


# NASA TECH BRIEF



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## Time-Shared Cathode Ray Tube



The basic objective of the time-shared Cathode Ray Tube (CRT) is to provide a high quality display at low cost display stations which utilize television monitors. The time-shared CRT provides most of the performance advantages of the individual CRT at each display station.

The time-shared Cathode Ray Tube (CRT) provides a method of updating a cluster of graphic displays from a computer. Using drum or disk storage, the system is time-shared to individual TV monitors, and would be useful and comparatively cheap in systems

not presently equipped for graphics time-sharing. This information may be of interest to manufacturers, developers and users of digital equipment and computer graphics capabilities.

The primary elements of the system include a relatively high cost CRT display system; a television camera used to snap a one-frame video picture of the display; a drum or disk which can be synchronized with television sync and timing to store this single frame video and continuously refresh the picture on the TV monitors; and a switching system between the

(continued overleaf)

TV camera and the drum (or disk) storage system which is used to route the outputs of the TV camera to the storage field associated with the individual TV monitors.

The use of the drum or disk for the storage and refresh task frees the CRT and TV camera to snap pictures for other television monitors. By providing sufficient switching and storage capacity at relatively low cost per monitor, the higher cost CRT display system can be shared by many display positions, thus offering a basic cost advantage over other systems.

The principal elements of the time-shared CRT are shown in the block diagram. The output of the digital computer consists of two types of data and of control words. One type is used to control the routing of the display to the appropriate display console, and the other controls the production of the display by the CRT. These data and control words are stored in the input buffer memory of the system until requested and acted upon by the CRT control unit.

The CRT control unit reads the data and control word list in the input buffer memory. It generates the necessary CRT control signals which produce the display, interprets the console routing control words, and generates the necessary video switching commands and write-head-selection commands to gate the TV camera output to the drum or disk field associated with the console selected. The TV video can be gated to more than one console by simultaneously activating the video switch nodes and drum write head for each console desired.

There are two additional features to the basic concept of the time-shared CRTs which can be implemented: the addition of background displays and the use of other devices than CRT-TV camera pairs to produce the video.

Time-sharing can be extended to other display devices. For example, recording storage tubes which provide strokewriting onto an electrostatic storage screen, and TV scan reading of the storage screen could easily be substituted for the CRT and TV camera in the time-shared CRT system. These devices have almost unlimited capacity and therefore could provide both dynamic and background data on the same tube. They have, however, a disadvantage of requiring extra cycles for erasing and priming the tube for its next usage.

**Note:**

Documentation is available from:

Clearinghouse for Federal Scientific

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